This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

What is claimed is:

Claim 1. (currently amended): A method of authenticating concealed and statistically varying multi-dimensional data, the method comprising the steps of:

acquiring an initial measurement of an item, wherein the initial measurement is subject to measurement error;

applying a transformation to the initial measurement to generate encrypted reference ~~template~~ data;

acquiring a subsequent measurement of an item, wherein the subsequent measurement is subject to measurement error;

applying the transformation to the subsequent measurement such that it is encrypted; and

calculating a Euclidean distance metric between the ~~transformed~~ encrypted measurements;

wherein the calculated Euclidean distance metric is identical to a Euclidean distance metric between the measurements prior to transformation.

Claim 2. (currently amended): The method of claim 1 wherein the steps of applying the transformation generate encrypted data that is substantially indistinguishable from Gaussian white noise.

Claim 3. (original): The method of claim 1 wherein the steps of applying the transformation comprise normalizing the measurements.

Claim 4. (original): The method of claim 3 wherein the normalizing step comprises centering and scale-transforming the measurements so that mean and standard deviation are fixed.

Claim 5. (original): The method of claim 1 wherein the steps of applying the transformation comprise permuting the measurements.

Claim 6. (original): The method of claim 5 wherein permuting comprises employing an item of secret information.

Claim 7. (original): The method of claim 6 wherein permuting comprises employing a passcode.

Claim 8. (original): The method of claim 7 wherein permuting additionally comprises employing the results of a hash function of the passcode.

Claim 9. (original): The method of claim 1 wherein the steps of applying the transformation comprise employing a linear transformation.

Claim 10. (original): The method of claim 9 wherein employing a linear transformation comprises employing a transformation matrix with orthonormal columns.

Claim 11. (original): The method of claim 10 wherein employing a linear transformation comprises employing a normalized Hadamard matrix.

Claim 12. (original): The method of claim 10 wherein employing a linear transformation comprises employing a normalized matrix comprising Fourier coefficients with a cosine / sine basis.

Claim 13. (original): The method of claim 9 wherein the employing a linear transformation comprises permuting the linearly transformed data.

Claim 14. (original): The method of claim 13 wherein permuting the linearly transformed data comprises employing an item of secret information.

Claim 15. (original): The method of claim 14 wherein permuting the linearly transformed data comprises employing a passcode.

Claim 16. (original): The method of claim 15 wherein permuting the linearly transformed data additionally comprises employing the results of a hash function of the passcode.

Claim 17. (original): The method of claim 1 wherein the measurements comprise biometric data.

Claim 18. (original): The method of claim 17 wherein the measurements comprise measurements selected from the group consisting of fingerprints, retinal scans, facial scans, hand geometry, spectral data, and voice data.

Claim 19. (original): The method of claim 17 additionally comprising the step of placing the reference template data on a smart card to be carried by an individual from whom the biometric data was taken.

Claim 20. (original): The method of claim 1 wherein the measurements comprise spectral data.

Claim 21. (original): The method of claim 20 wherein the measurements comprise weapons spectra.

Claim 22. (original): The method of claim 1 additionally comprising the step of adding pseudo-dimensions to the measurements to enhance concealment.

Claim 23. (currently amended): A method of ~~concealing~~ encrypting multidimensional digital input data and maintaining an ability to authenticate the concealed data, the method comprising the steps of:

normalizing the input data;

permuting elements of the normalized data;

linearly transforming the normalized and permuted data with a transformation matrix; and

permuting the linearly transformed data to create the concealed data;

wherein the concealed data can be authenticated without conversion back into the input data.

Claim 24. (original): The method of claim 23 wherein the normalizing step comprises centering and scale-transforming the data so that mean and standard deviation are fixed.

Claim 25. (original): The method of claim 23 wherein permuting the linearly transformed data comprises employing an item of secret information.

Claim 26. (original): The method of claim 23 wherein permuting elements comprises employing a passcode.

Claim 27. (original): The method of claim 26 wherein permuting elements comprises employing the results of a hash function of the passcode.

Claim 28. (original): The method of claim 23 wherein linerarly transforming comprises employing a transformation matrix with orthonormal columns.

Claim 29. (original): The method of claim 23 wherein permuting the linearly transformed data comprises employing an item of secret information.

Claim 30. (original): The method of claim 29 wherein permuting the linearly transformed data comprises employing a passcode.

Claim 31. (original): The method of claim 30 wherein permuting the linearly transformed data additionally comprises employing the results of a hash function of the passcode.

Claim 32. (original): The method of claim 23 wherein the concealed data is substantially indistinguishable from Gaussian white noise.

Claim 33. (original): The method of claim 23 wherein in the linearly transforming step the transformation matrix comprises a normalized Hadamard matrix.

Claim 34. (original): The method of claim 23 wherein in the linearly transforming step the transformation matrix comprises a normalized matrix comprising Fourier coefficients with a cosine / sine basis.

Claim 35. (original): The method of claim 23 wherein the input data comprises biometric data.

Claim 36. (original): The method of claim 35 wherein the input data comprises data selected from the group consisting of fingerprints, retinal scans, facial scans, hand geometry, spectral data, and voice data.

Claim 37. (original): The method of claim 35 additionally comprising the step of authenticating the transformed input date with reference template data on a smart card to be carried by an individual from whom the biometric data was taken.

Claim 38. (original): The method of claim 23 wherein the input data comprises spectral data.

Claim 39. (original): The method of claim 38 wherein the input data comprises weapons spectra.

Claim 40. (original): The method of claim 23 additionally comprising the step of adding pseudo-dimensions to the input data to enhance concealment.

Claim 41. (original): A method of concealing and authenticating statistically varying multi-dimensional data, the method comprising the steps of:

acquiring a measurement of an item, wherein the measurement is subject to measurement error;

applying a transformation to the measurement to substantially conceal the measurement; and

authenticating the transformed measurement without removing concealment of the transformed measurement and without employing an error-correction algorithm.